



A SYSTEM WITH LOAD SHARING TECHNIQUE VIA MOBILE NODE ROTATION FOR IMPROVING LIFETIME OF A WSN

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ABSTRACT

To enhance the lifetime of wireless sensor network various approaches have been tried. Extending network lifetime having limited power supplies is one of the big challenges facing wireless sensor networks (WSNs) due to sensor nodes. The nodes experience differential power consumption so extending wireless sensor networks lifetime is complicated. Consider the example, in a given routing topology nodes closer to the sink transmit more data hence nodes consume power more rapidly than nodes farther from the sink. To address differential power consumption and extend wireless sensor networks lifetime, new method for mobile node rotation, is using low-cost mobile sensor nodes. In proposed solution the nodes rotation take place through the high power consumption locations, and the algorithms for single and multiple rounds of rotations. The proposed solution show that mobile node rotation can extend WSN topology lifetime by more than eight times on average.

KEYWORDS: Wireless routing, Wireless sensor networks, energy optimization, network lifetime, mobile nodes.

INTRODUCTION:

Wireless sensor networks have developed an extensive range of applications recently. Many of these applications include tasks of collecting and transmitting a large amount of data. These applications are needed to be performing consistently over large amount of time because they are deployed in an aloof or unreachable environments. So it is a difficult task of manual maintenance of these applications such as battery replacement. Thus, there's a need of a system that will perform well and consume energy efficiently which will increase the lifetime of network. To achieve this, we propose a system with load sharing technique which will include swapping of nodes to distribute the load which will contribute in avoiding of network crashing. This will result in better performance and increased lifetime of the network.

MATERIALS AND METHODS:

Distributed Swap-Rate (Swap-Rate-d).

Distributed Swap-Level and Swap-LevelMergeAlgorithms

Uninterrupted Operation

RESULTS:

We compared the proposed system with current state of art systems for evaluation of performance using various criteria. The most important criteria is lifetime improved ratio. The Evaluations have shown that proposed system's lifetime is improved significantly. Although, it is Very important to include weather conditions and how often node recharging is done..

DISCUSSION:

The existing system contains load sharing technique which uses mobile node rotation for Distribution of load. This node rotation is achieved using three algorithms.

- 1) **Swap rate algorithm:** This algorithm searches for nearest node from base station and selects the next nearest node which will swap with every other node in the network till it reaches farthest node from the base station. The nearest node is the node with least distance which is calculated by formula,
- 2) **Swap level algorithm:** Unlike swap rate algorithm, this algorithm considers energy instead of distance. This algorithm is triggered when an energy of a node falls below threshold. The algorithm finds node with highest energy and searches nodes with energy level below threshold for swapping and swaps with them.
- 3) **Swap level merge:** Swap level merge is moderate solution between swap rate and swap level as it takes both energy and distance in consideration when searches for nearest node. The algorithm finds nearest node with highest energy for swapping and keeps swapping till the energy of node with maximum consumption reaches 0. For next iteration, it finds the nearest node

with high energy once again and takes it as a node with highest consumption and repeats the process

CONCLUSIONS:

In this paper, we have proposed an enhanced system which uses existing node rotation paradigm for increasing lifetime as well as solar energy for recharging and lifetime improvement of wireless sensor network. The results have shown the system improves the lifetime significantly. The node rotation technique helps in load sharing and extends the lifetime of a node for certain period of time and thus, lifetime of network is also improved. Furthermore, the dead node regeneration using solar energy recharges dead nodes using solar energy which reduces the overheads for maintenance issue of battery replacement.

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